Salt Water Disposal

Planning and Development Department

Purpose

- Overview of Issues Related to Salt Water Disposal Wells Within the City Limits of Fort Worth
- Receipt of Public Comments and Questions
- Recommendations to Fort Worth City Council in March, 2012

Meeting Schedule/Locations

January 19	TCC Corporate Training Center 13600 Heritage Parkway, Ste 100
January 26	TCC South Campus Student Center, Rm. SSTU 2105 5301 Campus Drive
February 2	Lost Creek Country Club 4101 Lost Creek Blvd.
February 9	TCC Opportunity Center 5901 Fitzhugh
February 23	City Council Chambers 1000 Throckmorton Street

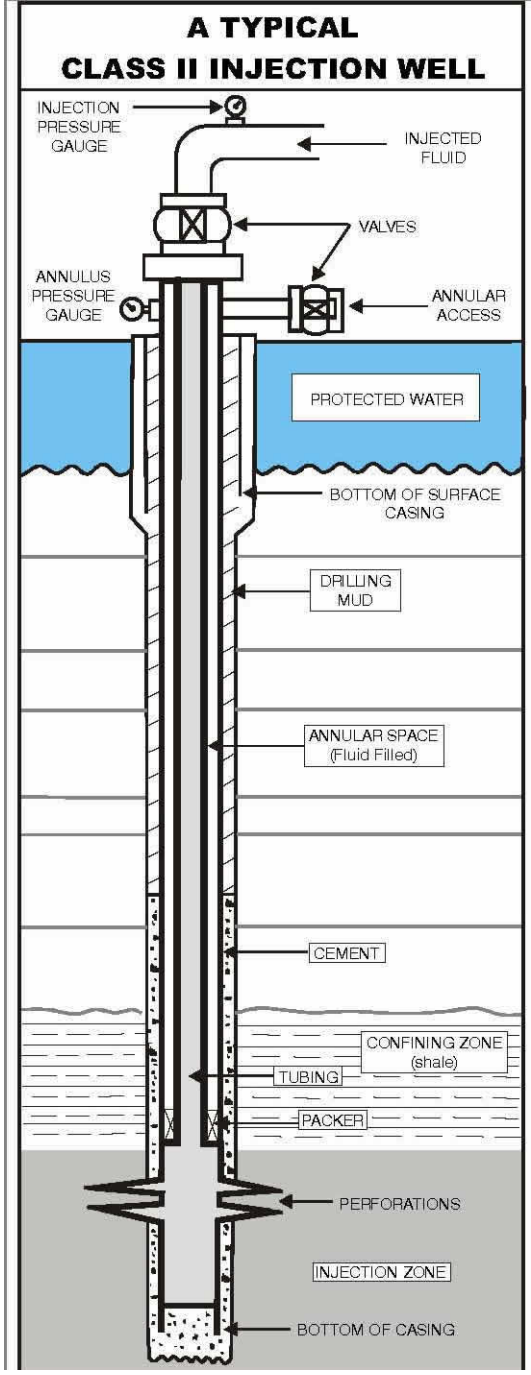
Meetings are from 7 PM to 9 PM

Panel Members

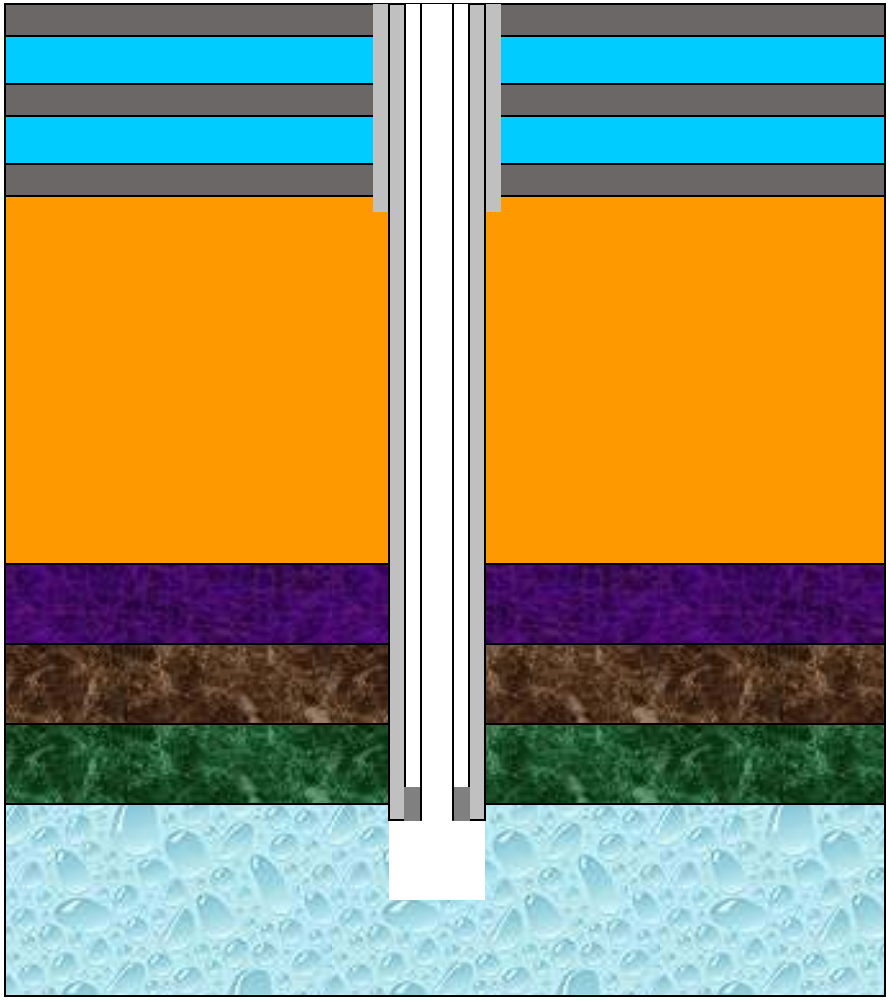
- Libby Willis, President Fort Worth League of Neighborhoods
- Judy Wood, President, Tarrant County League of Women Voters
- Russell Laughlin or Craig Schkade, Hillwood Development Corp.
- Stephen Lindsey, Sr. Director of Government and Community Affairs, Quicksilver Resources

What is It?

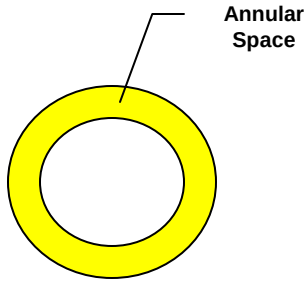
- The Environmental Protection Agency classifies injection wells into six classes
- Class II is used to dispose of salt water and other fluids
- Receiving underground formation is isolated from drinking water layers by impermeable formations



Injection Well



1) Surface Casing
2) Surface Casing Cement
3) Production Casing
4) Production Casing Cement
5) Packer
6) Steel Tubing



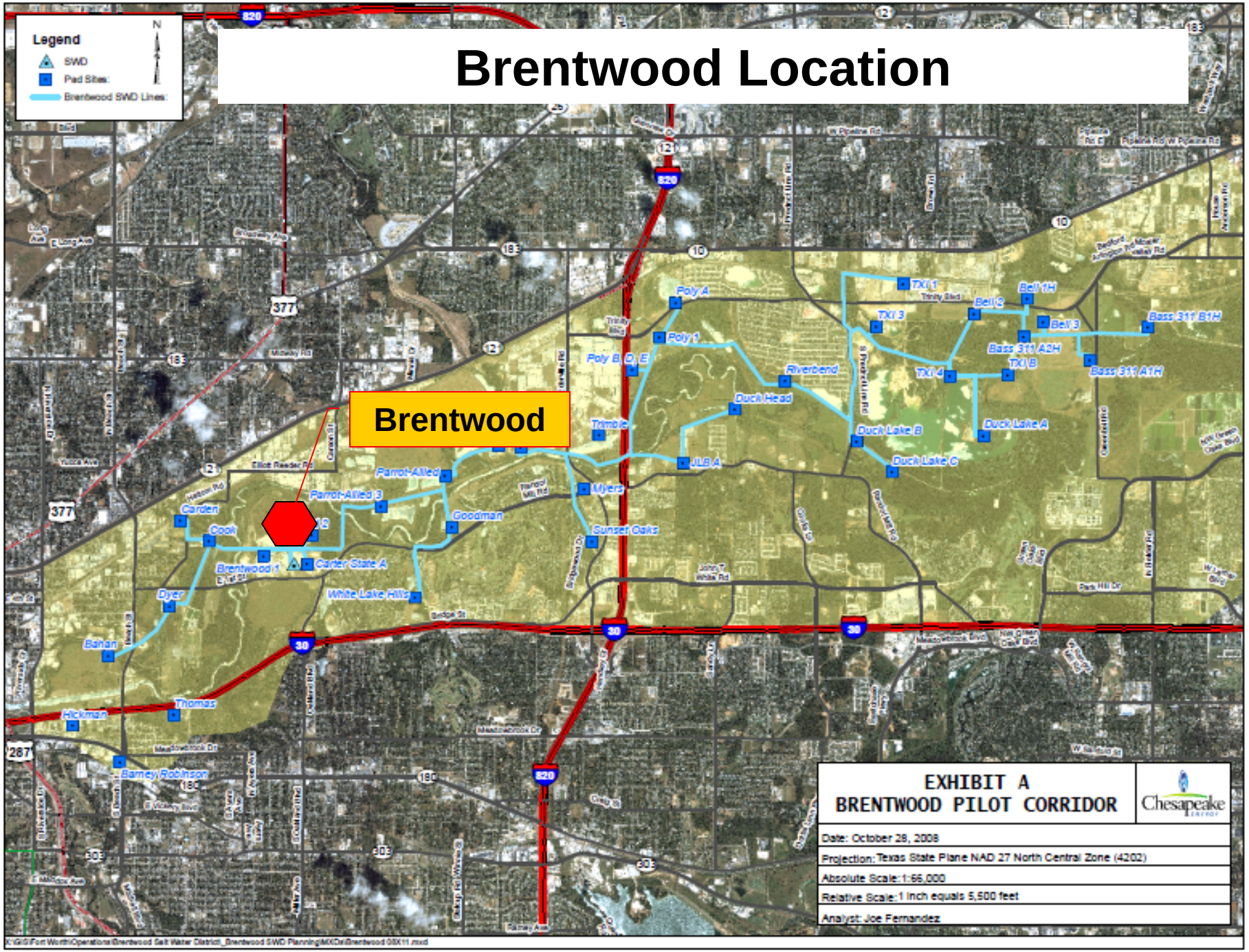
Who Regulates

- EPA awarded the RRC “primary enforcement responsibility” over oil and gas injection and disposal wells in 1982

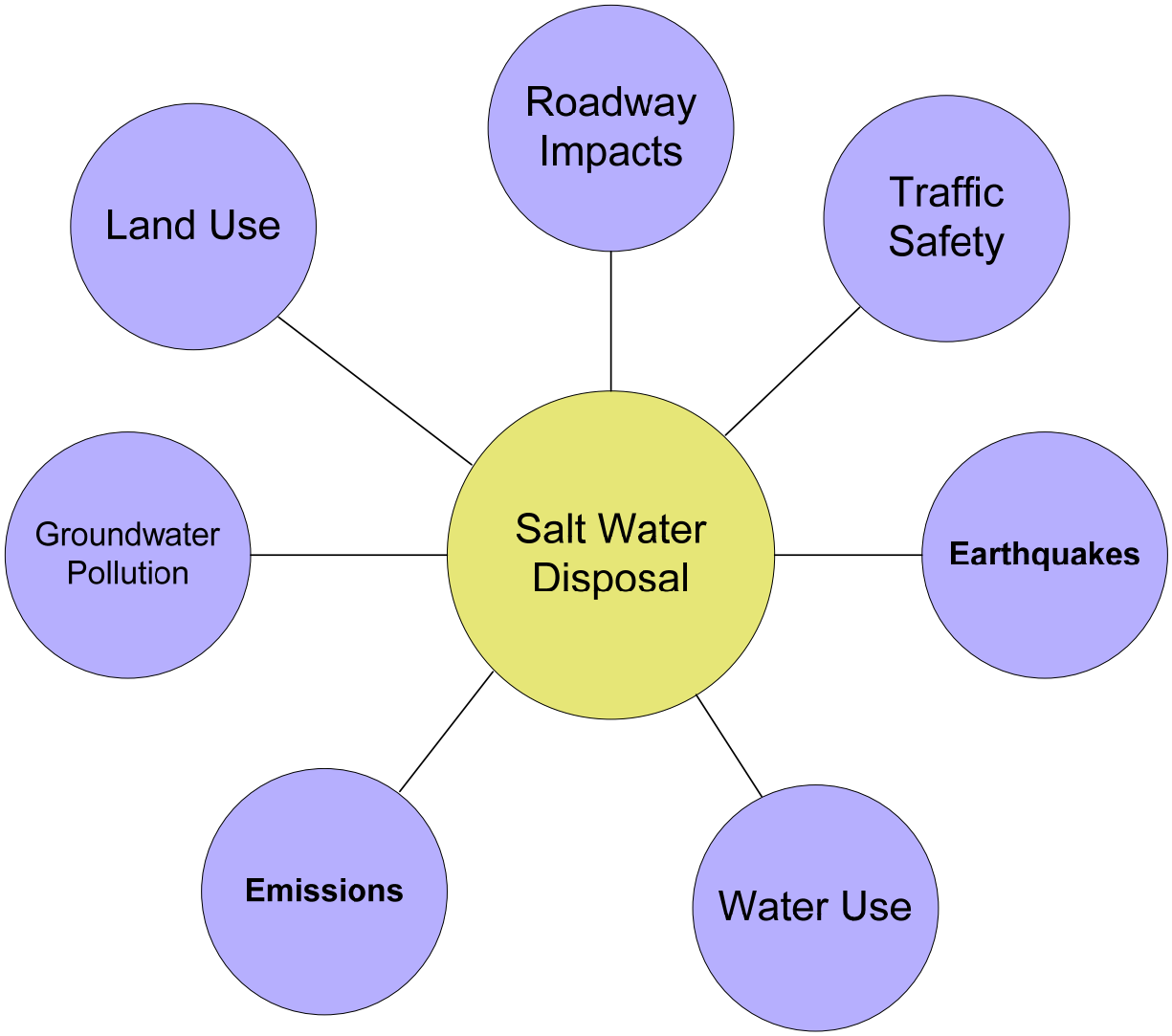
- RRC follows national guidelines under the federal Safe Drinking Water Act for surface and groundwater protection.

Regulatory Background
Fort Worth

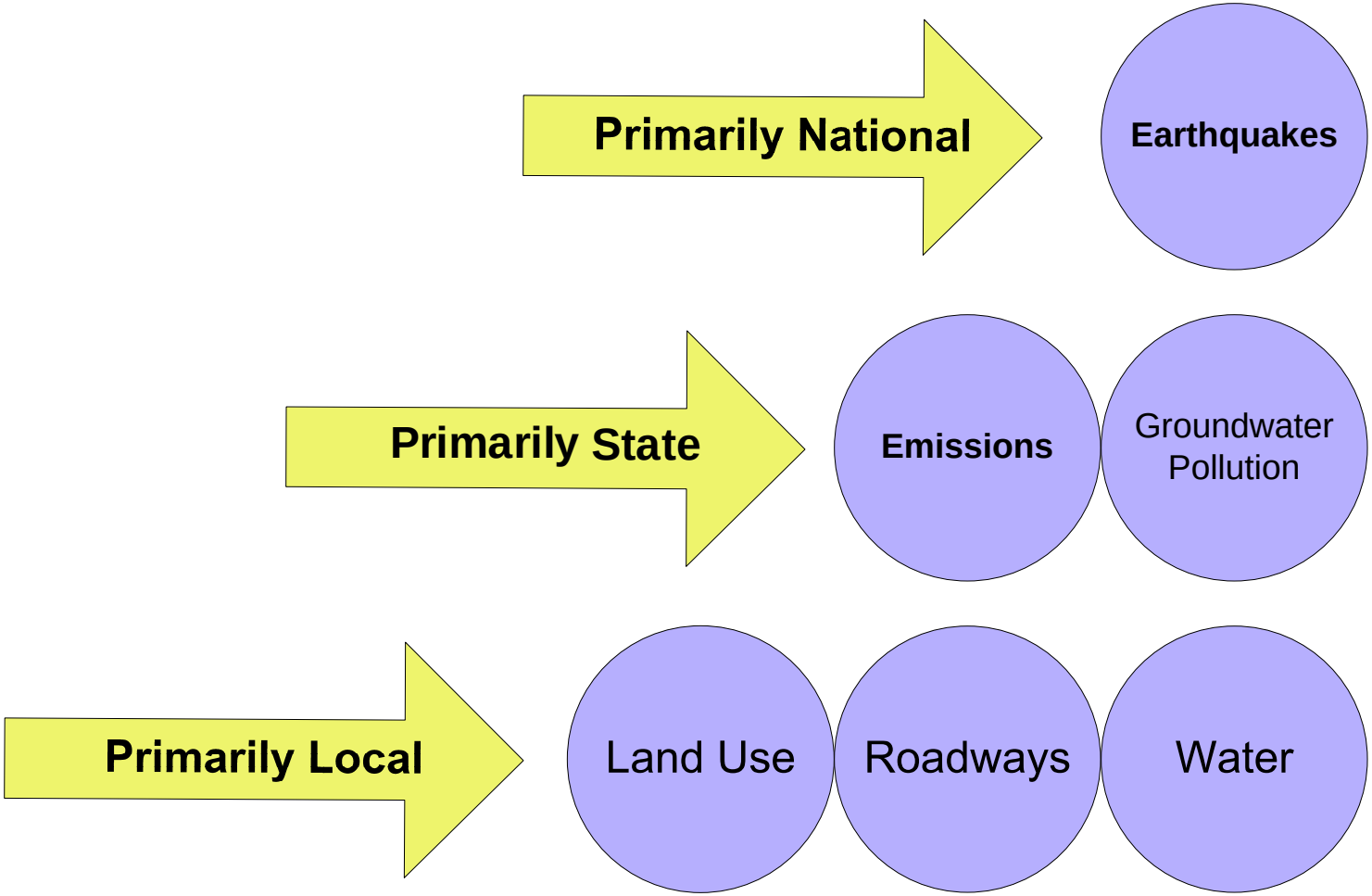
- SWD's, Oil and Gas Wells, Gas Pipelines Regulated by Gas Drilling Ordinance
- Regulatory authority over technical requirements such as casing, depths, etc… is limited
- Moratorium enacted on October 2, 2006, Expires April 30, 2012
- One Active SWD Operating within the City Limits – Brentwood

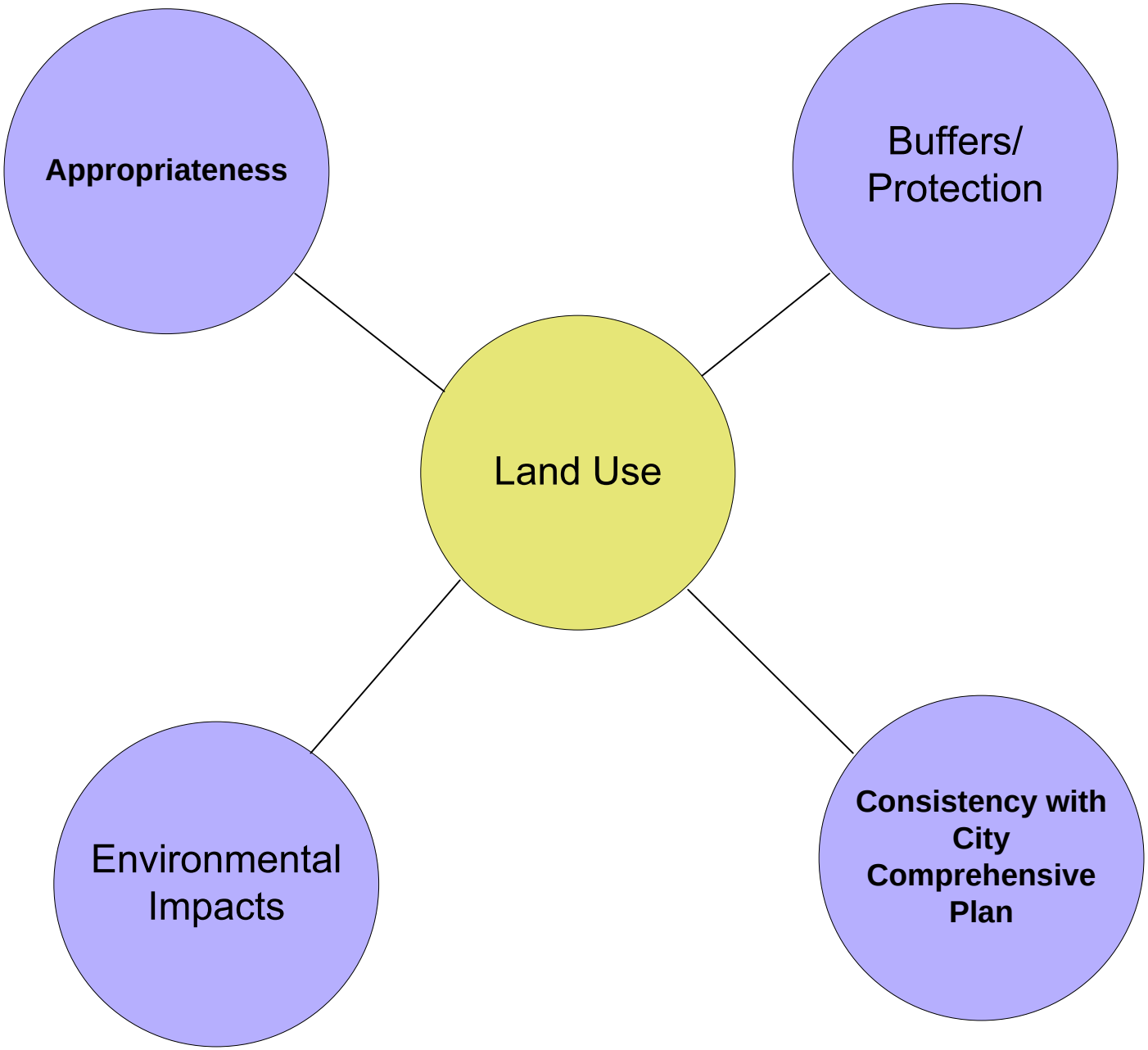

Brentwood Location
Legend
SWD
Pad Sites:
Brentwood SWD Lines:
N
Brentwood
Poly A
Poly 1
Poly B, D, E
Trimble
Riverbend
Duck Head
Duck Lake B
Duck Lake A
Duck Lake C
JLB A
TXI 1
TXI 3
TXI 4
TXI B
Bell 1H
Bell 2
Bell 3
Bass 311 B1H
Bass 311 A2H
Bass 311 A1H
Parrot-Allied
Parrot-Allied 3
Myers
Goodman
Sunset Oaks
Carden
Cook
Brentwood 1
Carter State A
White Lake Hills
Dyer
Barlan
Hickman
Thomas
Barney Robinson
EXHIBIT A
BRENTWOOD PILOT CORRIDOR
Chesapeake
Date: October 28, 2008
Projection: Texas State Plane NAD 27 North Central Zone (4202)
Absolute Scale: 1:66,000
Relative Scale: 1 inch equals 5,500 feet
Analyst: Joe Fernandez

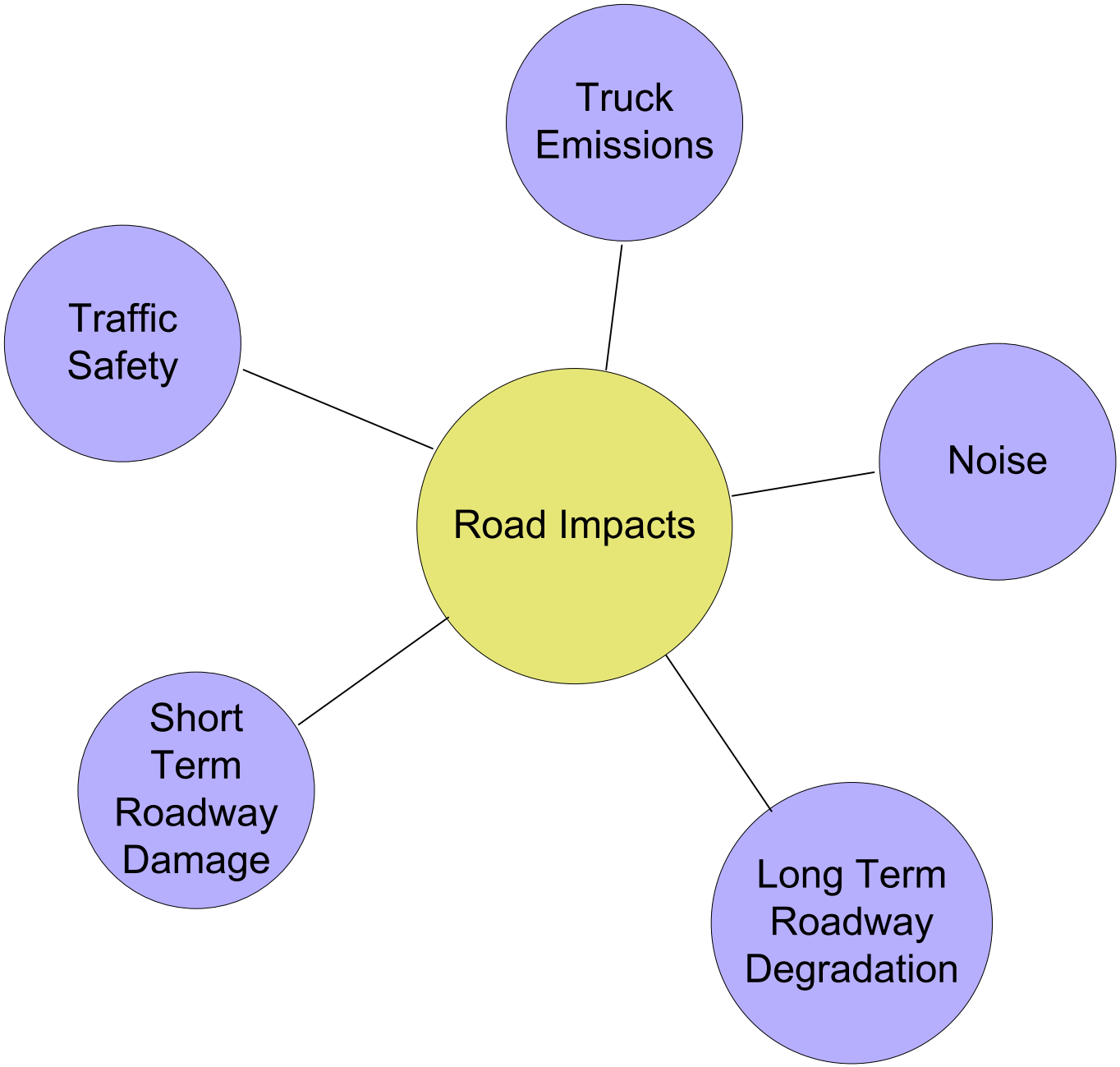
Salt Water Disposal Issues

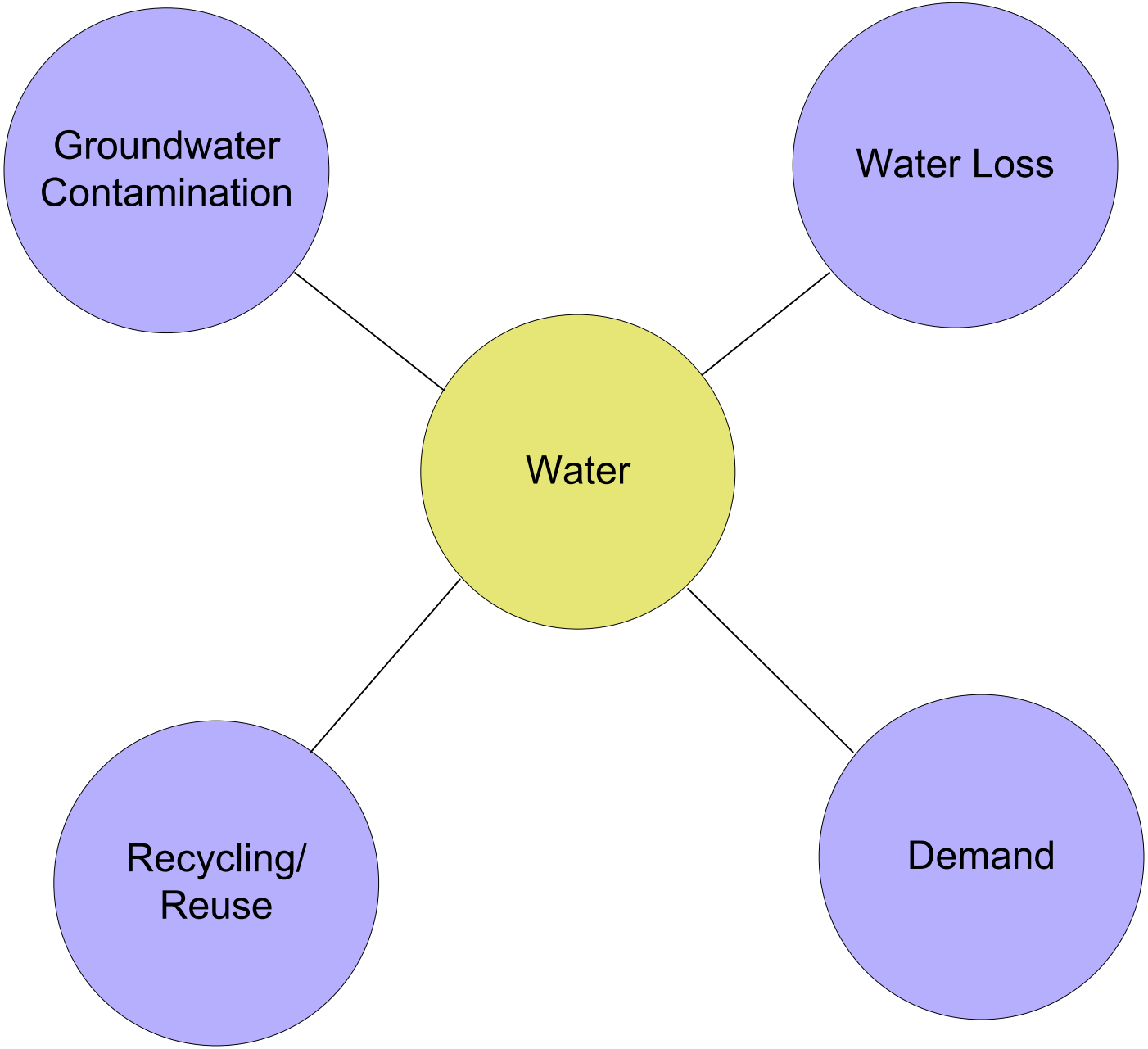


Regulatory Authority - Who Has Control?




Appropriateness
Buffers/ Protection
Land Use
Environmental Impacts
Consistency with City Comprehensive Plan


Truck Emissions
Traffic Safety
Road Impacts
Noise
Short Term Roadway Damage
Long Term Roadway Degradation


Groundwater Contamination
Water Loss
Water
Recycling/ Reuse
Demand

Recommended Ordinance Amendments 2011

- Access from industrial collector roadway classification or greater
- Restricted to “J” Medium Industrial, or “K” Heavy Industrial Zoned Districts
- No Protected Use closer than 1,000’ from Salt Water Disposal Well property line or City Council must review.

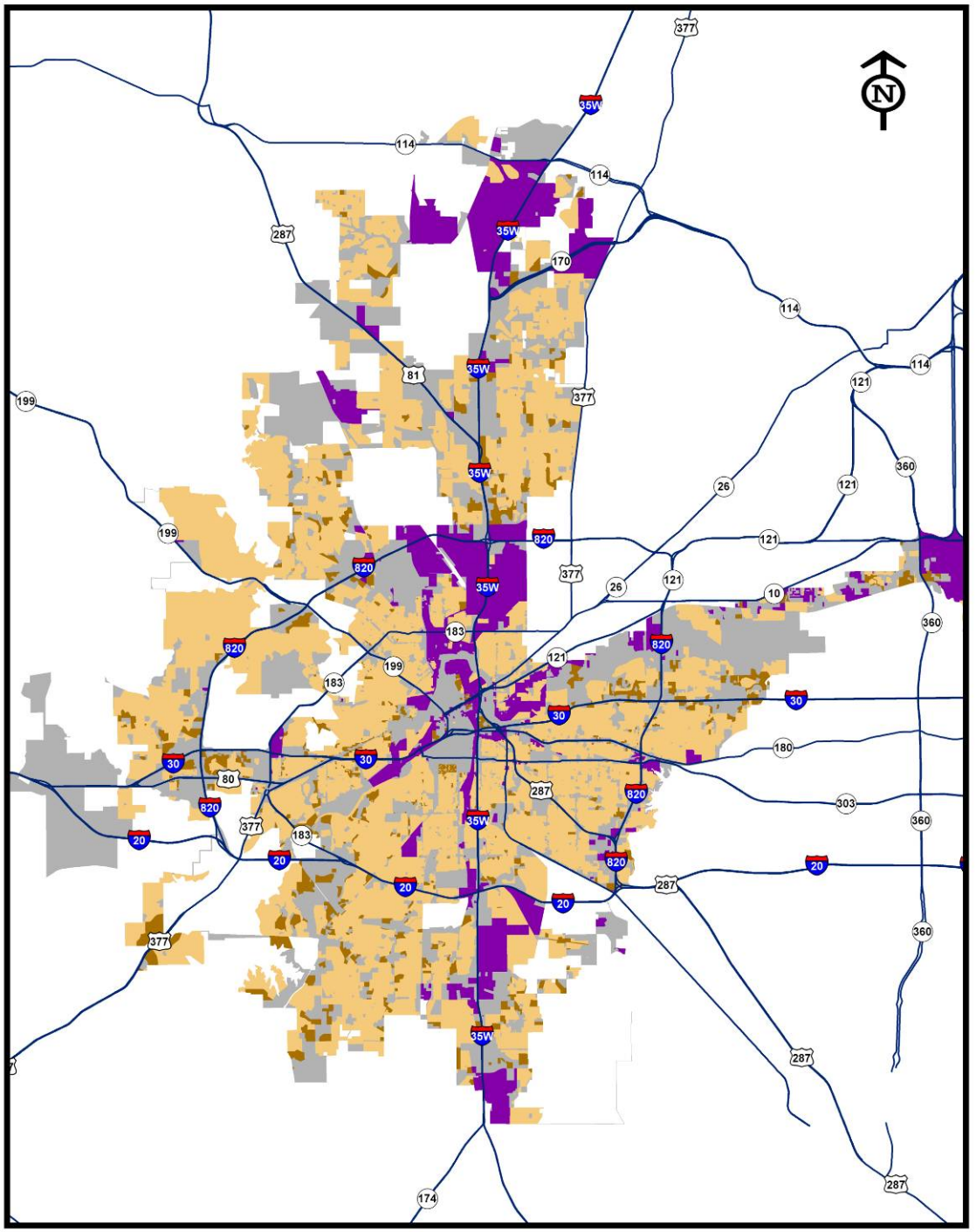
Recommended Ordinance Amendments

- Sound restrictions consistent with Compressor restrictions
- Salt water pipeline infrastructure exists or is planned to reduce truck traffic on City roadways
- Allowable tanks heights increased from 10’ to 30’ in “J” Medium Industrial, or “K” Heavy Industrial Zoned Districts

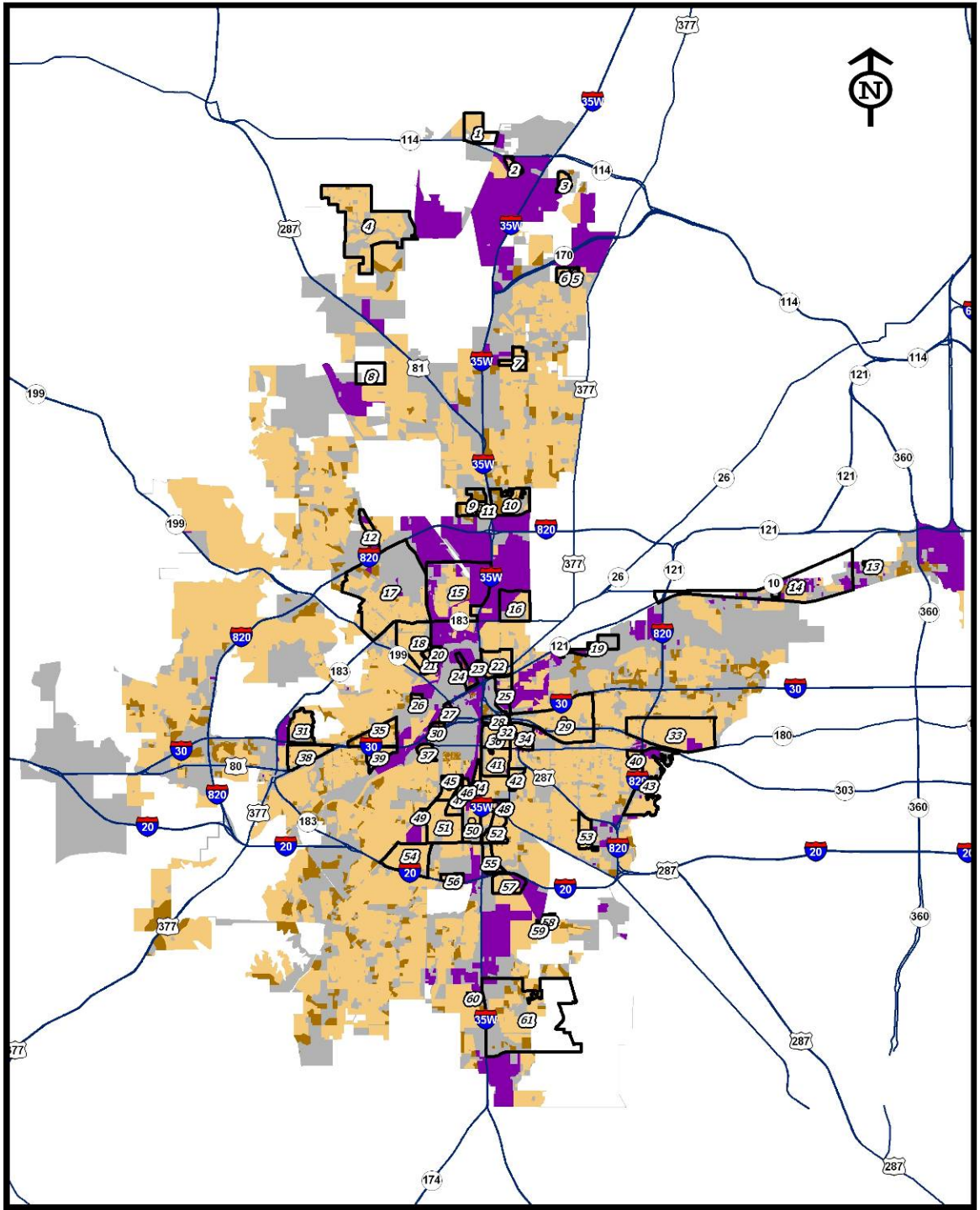
Why Consider SWD's

- 100 gas wells translates to ~20,000 truck trips per year. Therefore, SWD's with City Control:
  - Reduce overall truck traffic from pad sites
  - Reduces emissions
  - Prevents shortened design life of roadway system
  - Increases public safety
  - Reduces dust and overall roadway maintenance costs
  - Provides for appropriate Land Use

Counties do not have land use regulations such as zoning in Texas.

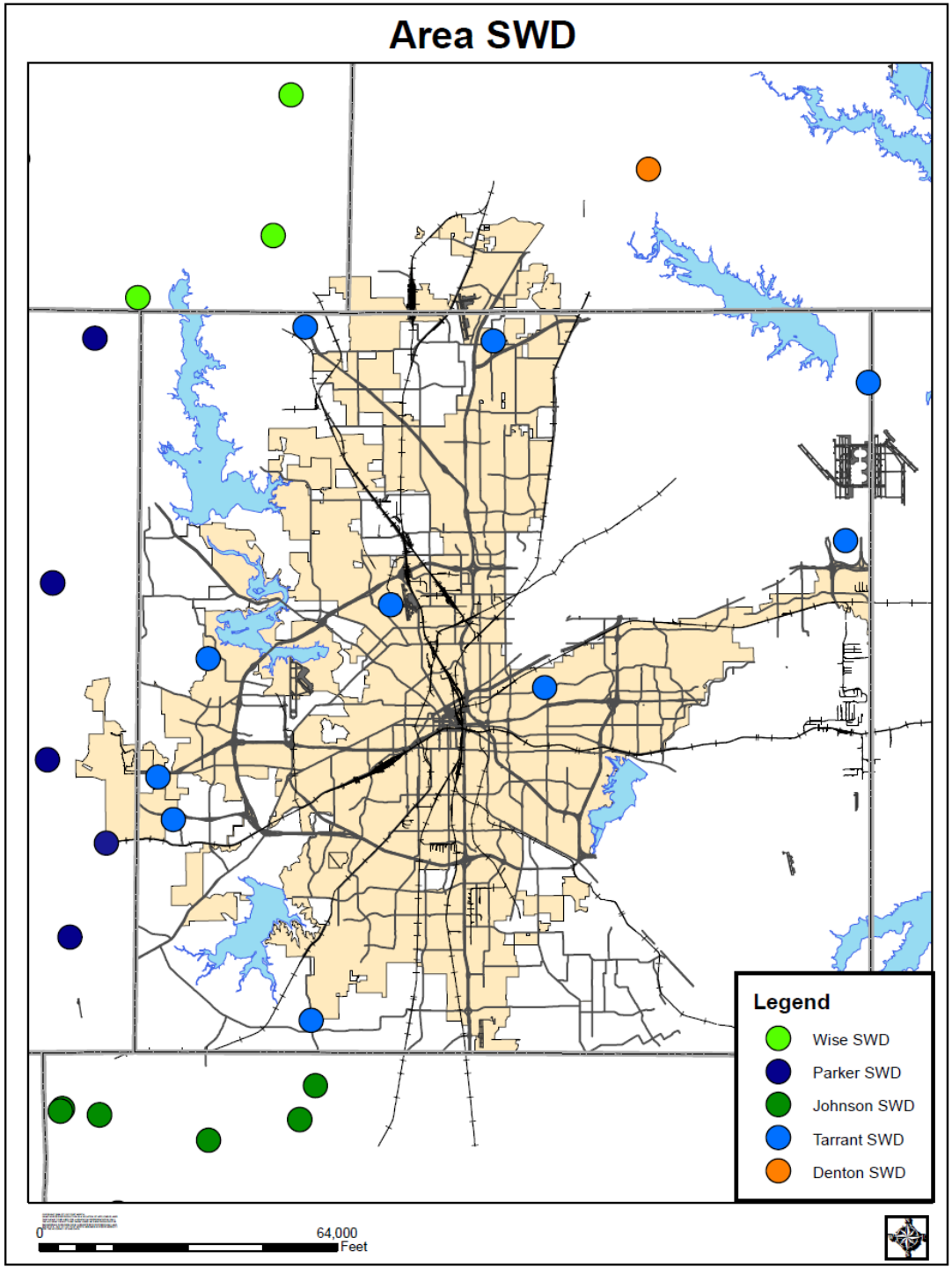


Neighborhood Associations within 1,000 feet of Industrial Zoning

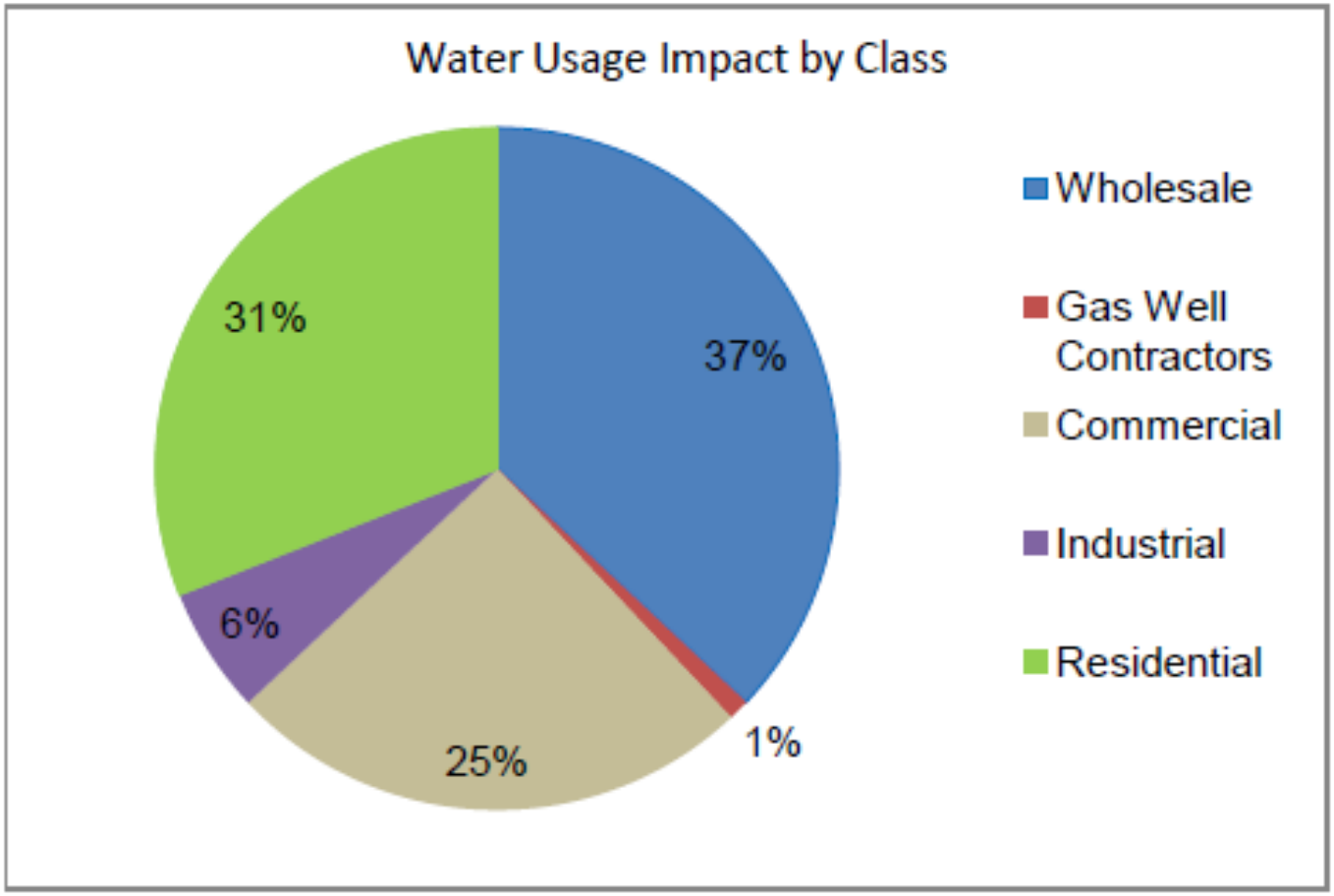


Neighborhood Associations within 1,000 feet of Industrial Zoning

MAPID	NAME	MAPID	NAME
1	Harriet Creek Ranch	32	Glenwood Triangle
2	Beechwood Creeks Residential	33	Handley
3	Chadwick Farms	34	Parker Essex Boaz
4	Sendera Ranch	35	Arlington Heights
5	Rolling Meadows	36	Historic Southside
6	Harvest Ridge	37	Mistletoe Heights
7	Crawford Farms	38	Ridglea North Association Inc.
8	Fossil Creek Estates	39	Alamo Heights
9	Northbrook	40	Historic Carver Heights
10	Fairway Bend	41	Hillside Morningside
11	The Crossing of Fossil Creek	42	Southeast Kingdom
12	Terrace Landing	43	Carver Heights East
13	Stonewood	44	West Morningside
14	Mosier Valley CAC, Inc.	45	Ryan Place Improvement Association
15	Diamond Hill-Jarvis	46	Jennings-May St. Louis
16	Bonnie Brae	47	South Hemphill Heights
17	Far Greater Northside Historical	48	Morningside Park
18	North Side	49	University Court
19	Garden of Eden	50	Worth Heights
20	Marine Park	51	Rosemont
21	La Nueva Northside	52	Carter Park
22	Scenic Bluff	53	Echo Heights
23	Greenway	54	South Hills
24	Rock Island/Samuels Ave.	55	Southland Terrace Neigh Imp Assn
25	United Riverside	56	North Greenbriar
26	Linwood	57	Highland Hills
27	Upper West Side	58	Alta Mesa East-H.E.L.P.
28	Near East Side	59	Quail Run
29	West Meadowbrook	60	Deer Creek North
30	Sunset Terrace	61	Garden Acres Area
31	Ridgmar		


Area SWD
Legend
Wise SWD
Parker SWD
Johnson SWD
Tarrant SWD
Denton SWD
0
64,000
Feet

Water Use
City of Fort Worth



Gas Well Life Cycle Water Use

Drilling

Drilling Mud

250,000 gallons/well

Completion

Hydraulic Fracture

3.5 – 5 million gallons

Flowback

15 – 40% of Frack Fluid (525,000 – 2,000,000 gallons)

Salinity estimated up to 80,000 ppm

Duration: 1 month +/-

Production

Produced Water

Primarily formation water

100 – 1,300 gallons/well/day

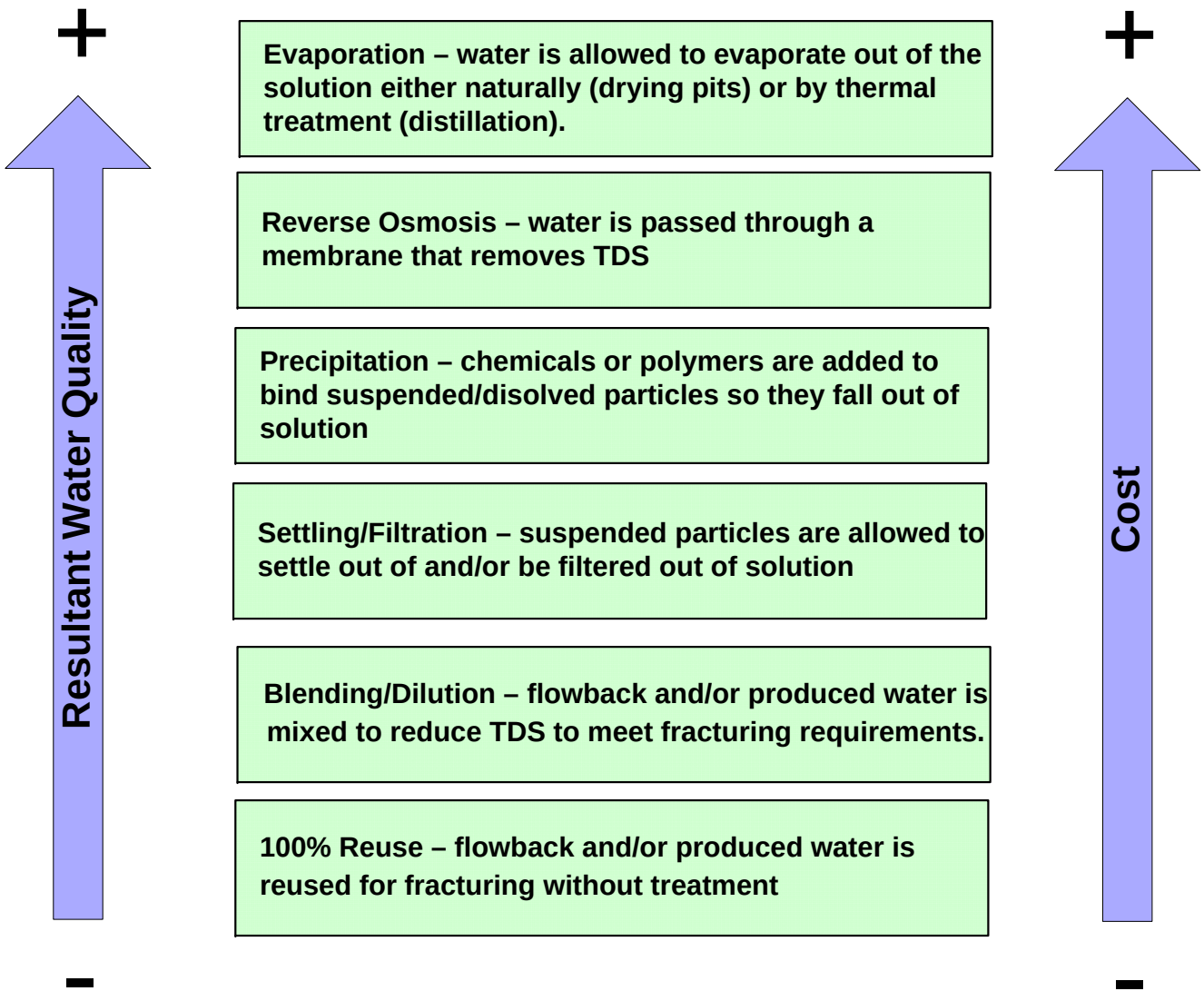
Salinity est. 80,000 -180,000 ppm

Duration: Life of the well

Alternative Water Sources for Hydraulic Fracturing

- Groundwater
- Surface Water
- Municipal Water
- Municipal/Industry Wastewater
- Produced Water/Flowback
- Other

Water Recycling Technologies



Water Recycling/Reuse Costs [A]

• **CFW Source Water**	**$0.25/bbl[B]**
• **Produced Water Reuse**	**?**
• **Dilution**	**~$1.50 – 2.00/bbl**
• **Settling**	**~$2.00 – 2.50/bbl**
• **Filtration – Removes**	**~$2.00 – 3.00/bbl**
• **Precipitation/Sedimentation**	**~$2.50 – 4.00/bbl**
• **Reverse Osmosis**	**?**
• **Evaporation/Distillation**	**~$5.50 – 8.00/bbl**

[A] Shale Gas Water Management Initiative, Antero Resources, Marcellus Shale, Dec. 1, 2011

[B] City of Fort Worth Water Department

Economic Considerations

- Capital Cost of Treatment Facilities
- Capital Cost of SWD
- Actual Treatment Cost
- Disposal of 100% produced/flow back water vs <100%
- Storage/hauling cost
- Piping vs Trucking
- Cost of Source Water

Option 1 – Prohibit SWD's

Pros

- CFW properties within the City's interior have protection

Cons

- Doesn't stop well permits in unregulated county
- SWD's on City's boundary impact CFW citizens without protections

Option 2 – Allow SWD's with Land Use Restrictions

Pros

- Provides protections for wells permitted within the City

Cons

- Doesn't stop well permits in unregulated county
- SWD's on City's boundary impacts CFW citizens without protections

Option 3 – Allow SWD's with Land Use Restrictions & Water Conservation Requirements

Pros

- Provides protections for wells permitted within the City
- Stewardship of water resources

Cons

- Doesn't stop well permits in unregulated county
- Economics may push permits to county unless incentives are given
- SWD's on City's boundary impacts CFW citizens without protections

Thank You